

## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>191</b>		<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. <b>PCT/KR 2003/001187</b>		International filing date (day/month/year) <b>17 June 2003 (17.06.2003)</b>	Priority Date (day/month/year)
International Patent Classification (IPC) or national classification and IPC <b>IPC<sup>7</sup>: G06F 17/28</b>			
Applicant <b>KWANGWOON FOUNDATION</b>			
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examination Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>5</u> sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of <u>1</u> sheets.</p> <p>3. This report contains indications relating to the following items:</p> <p>I. <input checked="" type="checkbox"/> Basis of the opinion</p> <p>II. <input type="checkbox"/> Priority</p> <p>III. <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p>IV. <input type="checkbox"/> Lack of unity of invention</p> <p>V. <input checked="" type="checkbox"/> Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI. <input type="checkbox"/> Certain documents cited</p> <p>VII. <input type="checkbox"/> Certain defects in the international application</p> <p>VIII. <input checked="" type="checkbox"/> Certain observations on the international application</p>			
Date of submission of the demand <b>13.01.2005</b>		Date of completion of this report <b>15 December 2005 (15.12.2005)</b>	
Name and mailing address of the IPEA/AT Austrian Patent Office Dresdner Straße 87 A-1200 Vienna Facsimile No. 1/53424/200		Authorized officer <b>KÖGL C.</b> Telephone No. 1/53424/440	

Form PCT/IPEA/409 (cover sheet) (July 1998)

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/KR 2003/001187

**I. Basis of the report**

## 1. With regard to the elements of the international application:\*

- ☐ the international application as originally filed
- ☒ the description:  
pages 2 to 9, as originally filed  
pages \_\_\_\_\_, filed with the demand  
pages 1, filed with the letter of 16 August 2004 (16.08.2004).
- ☒ the claims:  
pages 10 to 11, as originally filed  
pages \_\_\_\_\_, as amended (together with any statement) under Article 19  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_.
- ☒ the drawings:  
pages 1/2 to 2/2, as originally filed  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_.
- ☐ the sequence listing part of the description:  
pages \_\_\_\_\_, as originally filed  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_.

## 2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language \_\_\_\_\_ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

## 3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in printed form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_.
- ☐ the claims, Nos. \_\_\_\_\_.
- ☐ the drawings, sheets/fig. \_\_\_\_\_.

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\*

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.  
PCT/KR 2003/001187

## V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement			
Novelty (N)	Claims	1-2	YES
	Claims	---	NO
Inventive step (IS)	Claims	1-2	YES
	Claims	---	NO
Industrial applicability (IA)	Claims	1-2	YES
	Claims	---	NO

## Citations and explanations (Rule 70.7)

The correct title of the invention is "Method of generating an exceptional pronunciation dictionary for automatic Korean pronunciation generator" with the letter of August 16<sup>th</sup>, 2004 will be acknowledged (amendment under article 34 PCT).

In view of the English translations of the claims of the following two documents (D2 and D3) in the letter of October 19<sup>th</sup>, 2005, we hereby send you the Examination Report. The following documents have been cited in the International Search Report dated March 16<sup>th</sup>, 2004:

D1: US 6 119 085 A (Lewis et al.) 12/09/2000

D2: KR 1998/047177 B (Korea advanced institute of science and technology) 15/09/1998

D3: KR 2000/0031935 A (Korea electronics & telecommunications research institute)  
05/06/2000

D4: JP 2000/187495 A (NEC Corp.) 04/07/2000

Document D1 discloses a method for reconciling pronunciation differences between respective vocabularies of recognition and text to speech (TTS) engines in a speech application, first compares respective pronunciations of each word in the recognitions engines with each word's pronunciation by the TTS engine, second, for each word for which the pronunciations are different, the recognition engines pronunciation of the of the different word is added to an exception dictionary of the TTS engine. D1 is considered to represent the most relevant document. Document D1 comes very close to the invention of the present application. D1 show the essential technical features of claim 1 except the technical features like "setting phoneme conditions", "exceptional condition reference dictionary 1" and "exceptional pronunciation dictionary 2". Therefore, the subject matter of claims 1 and 2 is novel in respect of the cited document D1.

Document D2 shows a text analyser for Korean text-to-speech system. This document describes the technical feature that the inputted text sentence for which its morpheme has been analysed based on statistical information. In opposite to D2 the present

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.  
PCT/KR 03/01187**Supplemental Box**

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Box V (page 1)

application does not analyse based on statistical information. Therefore, the subject matter of claims 1 and 2 is **novel** in respect of the cited document D2 too.

Document D3 concerns to a method of automatically generation a phonetic lexicon for use in a speech recognition system. D3 describes a multi-layer perceptron learned so as directly map a corresponding phoneme to each grapheme of a word using a neural network. The method shown in D3 works in a complete different way than the invention described in the present application. Therefore, the subject matter of claims 1 and 2 is **novel** in respect of the cited document D3 as well.

Thus, contrary to the indications given in the International Search Report, presently claimed subject matter is considered **inventive**, because none of the cited documents discloses the claimed features like "setting phoneme conditions", "exceptional condition reference dictionary 1" and "exceptional pronunciation dictionary 2". Even a combination of the documents D1-D3 is not capable to question the inventive step of the present application.

D4 refers to a method and device for synthesizing speech and it shows a recording medium where the speech synthesis program is recorded. This document solves the problem of generating utterance information considering individuality of a speaker. Document D4 has a different task of the invention than it is shown in the present application. D4 represents a related art, which is not considered to be of particular relevance.

Summarising, the subject matter of **Claims 1 and 2** is novel and inventive in respect of the cited documents D1 to D4. Claims 1 and 2 of the present application are novel and hence patentable. Documents D1 to D4 show the general state of the art which is not considered to be of a particular relevance. The industrial applicability is acknowledged.

**INTERNATIONAL PRELIMINARY EXAMINATION REPORT**International application No.  
PCT/KR 2003/001187**VIII. Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

The correct title of the invention is "Method of generating an exceptional pronunciation dictionary for automatic Korean pronunciation generator" with the letter of August 16th, 2004 will be acknowledged (amendment under article 34 PCT).

IAP9 Rec'd PCT/PTO 19 DEC 2009

PCT/KR2003/001187

16.08.2004

~~EXCEPTIONAL PRONUNCIATION DICTIONARY GENERATION METHOD~~  
~~FOR THE AUTOMATIC PRONUNCIATION GENERATION IN KOREAN~~  
 METHOD OF GENERATING AN EXCEPTIONAL PRONUNCIATION  
 DICTIONARY FOR AUTOMATIC KOREAN PRONUNCIATION GENERATOR

5

# TECHNICAL FIELD

The present invention relates to a method of generating an exceptional pronunciation dictionary for automatic Korean pronunciation generator in a Text-to-Speech system or in an automatic speech recognition system.

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## BACKGROUND OF INVENTION

Conventionally, a method for automatic Korean pronunciation generator as shown in FIG. 1 comprises the steps of analyzing and pre-processing inputted text; analyzing morphemes of the text; tagging POS (part of speech); and generating  
 15 pronunciations based on an exceptional pronunciation dictionary and a part of regular rules for changing phonemes. The automatic Korean pronunciation generator is characterized by two parts: the dictionary of exceptional words and the part of regular rules for changing phonemes. The exceptional words have been recorded in the dictionary for exceptional words in a simple and random manner,  
 20 whereas the researches on the regular rules for changing phonemes have been actively progressed.

One example of regular rules is the Fortition of lenis consonant, e.g., a Korean word 'ㅋㅂㅣ'(k|kpi)' is pronounced as [ㅋㅂㅣ](k|kbi)]. Thus, it is the Fortition rule that the Korean letter 'ㅂ(p)' after 'ㄱ(k)' is pronounced as [ㅂㅂ(b)]. The Fortition  
 25 rule actually includes that 'ㄷ(t), ㄱ(k), ㅅ(s), ㅈ(c)' as well as 'ㅂ(p)' after 'ㄱ(k)' are respectively pronounced as [ㄷ(d), ㄱ(g), ㅅ(S), ㅈ(z)]. When a Korean